

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1 (Previously Presented): An integrated circuit comprising:

- a semiconductor substrate;
- a buried insulation layer directly over the semiconductor substrate;
- a first semiconductor mesa over the buried insulation layer;
- a first guard ring substantially surrounding the first semiconductor mesa, wherein the first guard ring extends through the buried insulation layer contacting the semiconductor substrate, and wherein the first guard ring is arranged to provide RF isolation for the first semiconductor mesa;
- a second guard ring substantially surrounding the second semiconductor mesa, wherein the second guard ring extends through the buried insulation layer contacting the semiconductor substrate, and wherein the second guard ring is arranged to provide RF isolation for the second semiconductor mesa; and,
- a third guard ring between the first and second guard rings, wherein the third guard ring is in contact with the semiconductor substrate, and wherein the third guard ring is arranged to provide further RF isolation for the first and second semiconductor mesas.

Claim 2 (Original): The integrated circuit of claim 1 wherein the semiconductor substrate comprises a high resistivity semiconductor substrate.

Claim 3 (Previously Presented): The integrated circuit of claim 1 wherein the semiconductor substrate comprises a silicon substrate, wherein the buried insulating layer comprises a buried silicon oxide layer, and wherein the first semiconductor mesa comprises a silicon mesa, and wherein the second semiconductor mesa comprises a silicon mesa.

Claim 4 (Currently Amended): The integrated circuit of claim 3 wherein the silicon substrate comprises a high ~~resistivity~~ resistivity silicon substrate.

Claim 5 (Previously Presented): The integrated circuit of claim 1 wherein the semiconductor substrate is doped in an area that is contacted by the first guard ring, and wherein the semiconductor substrate is doped in an area that is contacted by the second guard ring.

Claim 6 (Currently Amended): The integrated circuit of claim 5 wherein the semiconductor substrate comprises a high ~~resistivity~~ resistivity semiconductor substrate.

Claim 7 (Previously Presented): The integrated circuit of claim 5 wherein the semiconductor substrate comprises a silicon substrate, wherein the buried insulating layer comprises a buried silicon oxide layer, wherein the first semiconductor mesa comprises a silicon mesa, and wherein the second semiconductor mesa comprises a silicon mesa.

Claim 8 (Currently Amended): The integrated circuit of claim 7 wherein the silicon substrate comprises a high ~~resistivity~~ resistivity silicon substrate.

Claim 9 (Previously Presented): The integrated circuit of claim 1 further comprising:
a first insulating ring between the first guard ring and the first semiconductor mesa,
wherein the first insulating ring surrounds the first semiconductor mesa; and
a second insulating ring between the second guard ring and the second semiconductor mesa, wherein the second insulating ring surrounds the second semiconductor mesa.

Claim 10 (Original): The integrated circuit of claim 9 wherein the semiconductor substrate comprises a high resistivity semiconductor substrate.

Claim 11 (Previously Presented): The integrated circuit of claim 9 wherein the semiconductor substrate comprises a silicon substrate, wherein the buried insulating layer comprises a buried silicon oxide layer, wherein the first insulating ring comprises a silicon oxide insulating ring, wherein the second insulating ring comprises a silicon oxide insulating ring, wherein the first semiconductor mesa comprises a silicon mesa, and wherein the second semiconductor mesa comprises a silicon mesa.

Claim 12 (Original): The integrated circuit of claim 11 wherein the silicon substrate comprises a high resistivity silicon substrate.

Claim 13 (Previously Presented): The integrated circuit of claim 9 wherein the semiconductor substrate is doped in an area that is contacted by the first guard ring, and wherein the semiconductor substrate is doped in an area that is contacted by the second guard ring.

Claim 14 (Original): The integrated circuit of claim 13 wherein the semiconductor substrate comprises a high resistivity semiconductor substrate.

Claim 15 (Previously Presented): The integrated circuit of claim 13 wherein the semiconductor substrate comprises a silicon substrate, wherein the buried insulating layer comprises a buried silicon oxide layer, wherein the first insulating ring comprises a silicon oxide insulating ring, wherein the second insulating ring comprises a silicon oxide ring, wherein the first semiconductor mesa comprises a silicon mesa, and wherein the second semiconductor mesa comprises a silicon mesa.

Claim 16 (Original): The integrated circuit of claim 15 wherein the silicon substrate comprises a high resistivity silicon substrate.

Claim 17 (Previously Presented): The integrated circuit of claim 1 wherein the first guard ring comprises a low resistivity guard ring, and wherein the second guard ring comprises a low resistivity guard ring.

Claim 18 (Previously Presented): The integrated circuit of claim 1 wherein the first guard ring comprises a metal guard ring, and wherein the second guard ring comprises a metal guard ring.

Claim 19 (Previously Presented): The integrated circuit of claim 18 wherein the first and second metal guard rings comprise tungsten guard rings.

Claim 20 (Withdrawn): An integrated circuit comprising:
a semiconductor substrate;
a buried insulation layer over the semiconductor substrate;
a first semiconductor mesa over the buried insulation layer;
a second semiconductor mesa over the buried insulation layer;
a first guard ring substantially surrounding the first semiconductor mesa, wherein the first guard ring is in contact with the semiconductor substrate, and wherein the first guard ring is arranged to provide RF isolation for the first semiconductor mesa; and,
a second guard ring substantially surrounding the second semiconductor mesa, wherein the second guard ring is in contact with the semiconductor substrate, and wherein the second guard ring is arranged to provide RF isolation for the second semiconductor mesa.

Claim 21 (Withdrawn): The integrated circuit of claim 20 further comprising a third guard ring between the first and second guard rings, wherein the third guard ring is in contact with the semiconductor substrate, and wherein the third guard ring is arranged to provide further RF isolation for the first and second semiconductor mesas.

Claim 22 (Withdrawn): The integrated circuit of claim 21 wherein the semiconductor substrate comprises a high resistivity semiconductor substrate.

Claim 23 (Withdrawn): The integrated circuit of claim 21 wherein the semiconductor substrate comprises a silicon substrate, wherein the buried insulating layer comprises a buried silicon oxide layer, wherein the first semiconductor mesa comprises a first silicon mesa, and wherein the second semiconductor mesa comprises a second silicon mesa.

Claim 24 (Withdrawn): The integrated circuit of claim 21 wherein the semiconductor substrate is doped in a first area that is contacted by the first metal guard ring, wherein the semiconductor substrate is doped in a second area that is contacted by the second metal guard ring, and wherein the semiconductor substrate is doped in a third area that is contacted by the third metal guard ring.

Claim 25 (Withdrawn): The integrated circuit of claim 21 further comprising first and second insulating rings, wherein the first insulating ring surrounds the first semiconductor mesa and is between the first metal guard ring and the first semiconductor mesa, and wherein the second insulating ring surrounds the second semiconductor mesa and is between the second metal guard ring and the second semiconductor mesa.

Claim 26 (Withdrawn): The integrated circuit of claim 25 wherein the semiconductor substrate is doped in a first area that is contacted by the first metal guard ring, and wherein the semiconductor substrate is doped in a second area that is contacted by the second metal guard ring.

Claim 27 (Withdrawn): The integrated circuit of claim 21 wherein the first guard ring comprises a first low resistivity guard ring, wherein the second guard ring comprises a first low resistivity guard ring, and wherein the third guard ring comprises a third low resistivity guard ring.

Claim 28 (Withdrawn): The integrated circuit of claim 21 wherein the first guard ring comprises a first metal guard ring, wherein the second guard ring comprises a second metal guard ring, and wherein the third guard ring comprises a third metal guard ring.

Claim 29 (Withdrawn): The integrated circuit of claim 28 wherein the first metal guard ring comprises a first tungsten guard ring, wherein the second metal guard ring comprises a second tungsten guard ring, and wherein the third metal guard ring comprises a third tungsten guard ring.

Claim 30 (Withdrawn): The integrated circuit of claim 21 wherein the first semiconductor mesa is part of a sub-circuit, wherein the sub-circuit includes one or more other semiconductor mesas, wherein the first semiconductor mesa and the one or more other semiconductor mesas are individually surrounded by the first guard ring, and wherein the third guard ring surrounds the first guard ring.

Claim 31 (Withdrawn): The integrated circuit of claim 20 wherein the semiconductor substrate is doped in a first area that is contacted by the first guard ring, and wherein the semiconductor substrate is doped in a second area that is contacted by the second guard ring.

Claim 32 (Withdrawn): A method of RF isolating a semiconductor feature of an integrated circuit comprising:

- forming a buried insulation layer over a semiconductor substrate;

- forming a semiconductor feature in one or more semiconductor layers so that the semiconductor feature is formed over a portion of the buried insulation layer, wherein the buried insulating layer has a trench therethrough down to the semiconductor substrate that substantially encloses the portion of the buried insulation layer, wherein the one or more semiconductor layers has a trench therethrough that substantially encloses the semiconductor feature, and wherein the trench through the one or more semiconductor layers substantially aligns with the trench through the buried insulating layer; and,

- filling the trench through the one or more semiconductor layers and the trench through the buried insulating layer with conducting material having low resistivity so that a conductive guard ring substantially surrounds the semiconductor feature.

Claim 33 (Withdrawn): The method of claim 32 wherein the semiconductor substrate comprises a high resistivity semiconductor substrate.

Claim 34 (Withdrawn): The method of claim 32 further comprising doping an area of the semiconductor substrate that is contacted by the conductive guard ring.

Claim 35 (Withdrawn): The method of claim 32 further comprising forming an insulating ring surrounding the semiconductor feature such that the insulating ring is between the conductive guard ring and the semiconductor feature.

Claim 36 (Withdrawn): The method of claim 32 wherein the semiconductor feature comprises a first semiconductor feature, wherein the portion of the buried insulation layer comprises a first portion of the buried insulation layer, wherein the trench through the buried insulating layer comprises a first trench through the buried insulating layer, wherein the trench through the one or more semiconductor layers comprises a first trench through the one or more semiconductor layers, and wherein the conductive guard ring comprises a first conductive guard ring, the method further comprising:

forming a second semiconductor feature in the one or more semiconductor layers so that the second semiconductor feature is formed over a second portion of the buried insulation layer, wherein the buried insulating layer has a second trench therethrough down to the semiconductor substrate that substantially encloses the second portion of the buried insulation layer, wherein the one or more semiconductor layers has a second trench therethrough that substantially encloses the second semiconductor feature, and wherein the second trench through the one or more semiconductor layers is substantially aligned with the second trench through the buried insulating layer; and,

filling the second trench through the one or more semiconductor layers and the second trench through the buried insulating layer with conducting material having low resistivity so that a second conductive guard ring substantially surrounds the second semiconductor feature.

Claim 37 (Withdrawn): The method of claim 36 further comprising forming a third conductive guard ring between the first and second conductive guard rings, the third conductive guard ring being in contact with the semiconductor substrate.

Claim 38 (Withdrawn): The method of claim 32 further comprising grounding the conductive guard ring.

Claim 39 (Withdrawn): An integrated circuit comprising: a semiconductor substrate, the semiconductor substrate forming a first semiconductor layer; a semiconductor feature formed in a second semiconductor layer, wherein the second semiconductor layer is over the first semiconductor layer; and, a guard ring substantially surrounding the semiconductor feature, wherein the guard ring is in contact with the semiconductor substrate, and wherein the guard ring is arranged to provide RF isolation for the semiconductor feature.

Claim 40 (Previously Presented): The integrated circuit of claim 1, wherein the third guard ring is a low resistivity guard ring.

Claim 41 (Currently Amended): The integrated circuit of claim 1, wherein the first semiconductor mesa is one of a first group of semiconductor mesas, wherein the first guard ring is one of a first group of guard rings that individually surrounds each semiconductor mesa in the group of semiconductor mesas, and wherein the third guard ring surrounds the first group of guard ring rings.